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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,490	10/02/2003	Peter Hallemeier	OPT-008CP	2489

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EXAMINER	
ROJAS, OMAR R	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 06/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/605,490	HALLEMEIER ET AL.	
	Examiner	Art Unit	
	Omar Rojas	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-39* is/are pending in the application.

4a) Of the above claim(s) *3-5,16,23,24 and 29-38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6-15,17-22,25-28, and 39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *October 2, 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *Detailed Action*.

DETAILED ACTION

Election/Restrictions

1. Claims 1, 14, and 22 are generic to a plurality of disclosed patentably distinct species comprising Specie A (Figure 1, Claims 1, 2, 6-15, 17-22, 25-28, and 39) and Specie B (Figure 4, Claims 3-5, 16, 23, 24, and 33-38). Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, even though this requirement is traversed.

2. Claim 22 is generic to a plurality of disclosed patentably distinct species comprising Specie A (Figure 1, Claims 1, 2, 6-15, 17-22, 25-28, and 39) and Specie C (Figure 7, Claims 29-32). Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, even though this requirement is traversed.

3. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

4. Claims 1, 14, and 22 link(s) inventions of Species A and B. The restriction requirement between the linked inventions is subject to the nonallowance of the linking claim(s), claims 1, 14, and 22. Upon the allowance of the linking claim(s), the restriction requirement as to the linked inventions shall be withdrawn and any claim(s) depending from or otherwise including all the limitations of the allowable linking claim(s) will be entitled to examination in the instant application. Applicant(s) are advised that if any such claim(s) depending from or including all the limitations of the allowable linking claim(s) is/are presented in a continuation or divisional

application, the claims of the continuation or divisional application may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

5. Claim 22 link(s) inventions of Species A and C. The restriction requirement between the linked inventions is subject to the nonallowance of the linking claim(s), claim 22. Upon the allowance of the linking claim(s), the restriction requirement as to the linked inventions shall be withdrawn and any claim(s) depending from or otherwise including all the limitations of the allowable linking claim(s) will be entitled to examination in the instant application. Applicant(s) are advised that if any such claim(s) depending from or including all the limitations of the allowable linking claim(s) is/are presented in a continuation or divisional application, the claims of the continuation or divisional application may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

6. During a telephone conversation with Kurt Rauschenbach on May 23, 2005, a provisional election was made with traverse to prosecute the invention of Specie A: claims 1, 2, 6-15, 17-22, 25-28, and 39. Affirmation of this election must be made by applicant in replying to this Office action. Claims 3-5, 16, 23-24, and 29-38 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

8. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-2, 10-12, 14-15, 17-20, 22, 26-28, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by the article titled "A Mode-Filtering Scheme for Improvement of the Bandwidth-Distance in Multimode Fiber Systems" to Haas et al. published in the Journal of Lightwave Technology (hereinafter "the Haas article"), provided by applicant(s) in an information disclosure statement.

Regarding claim 1, Haas discloses a multi-mode optical fiber link (see Figures 1 and 2) comprising:

a first spatial mode converter ("AT&T splice") having an input that is coupled to an output of a single mode fiber, the first spatial mode converter conditioning a modal profile of an optical signal propagating from the single mode optical fiber to the first spatial mode converter (e.g., see page 1126 at the second column);

a multi-mode optical fiber having an input that is coupled to an output of the first spatial mode converter; and

a second spatial mode converter (the second "AT&T splice" shown in Fig. 1) having an input that is coupled to an output of the multi-mode optical fiber and an output that is coupled to a second single mode optical fiber, the second spatial mode converter reducing a number of optical modes in the optical signal, wherein both the first and the second spatial mode converters increase an effective modal bandwidth of the optical signal. See the Haas article at page 1126.

Regarding claims 2-3, the claimed limitations are described on page 1127 of the Haas article.

Regarding claim 10, the claimed limitations are described on page 1126 of the Haas article.

Regarding claims 11-12, the Haas article clearly describes limiting "the number of lower order modes" launched into the multimode fiber (page 1126 at column 1). This inherently includes filtering out not only higher order modes, but at least some of the lower order modes as well.

Regarding claims 14-15, 22, 26-28, and 39, the previous remarks are incorporated herein. All the recited limitations of claims 14-15, 22, 26-29, and 39 are expressly disclosed in or suggested

by the Haas article.

Regarding claims 17-20, it is noted that claims 17-20 merely recite that the spatial mode converters themselves reduce the changes in effective modal bandwidth caused by thermal variations, polarization effects, mechanical stress, and/or optical fiber splices. No specific method step is given by claims 17-20 other than the operation of the spatial mode converters. Thus, the limitations of claims 17-20 appear to be an inherent property resulting from the operation of the spatial mode converters. Therefore, because Haas teaches using spatial mode converters, the limitations of claims 17-20 are also considered inherently present in Haas.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 6, 21, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Haas article as applied to claims 2, 14, and 22 above, and further in view of Patent No. 5,515,196 to Kitajima et al. (hereinafter "Kitajima").

Regarding claims 6, 21, and 25, the Haas article differs from the claims in that it does not expressly teach a second optical source having an output that is coupled to the input of the single mode optical fiber, the second optical source generating a second optical signal having a second wavelength at the output.

Kitajima, on the other hand, teaches a second optical source (Fig. 12, 111-2) having an output that is coupled to the input of an optical fiber, the second optical source 111-2 generating a second optical signal having a second wavelength at the output (column 11, lines 1-15).

The ordinary skilled artisan would have been motivated to use a second optical source generating a second optical signal having a second wavelength at the output for wavelength division multiplexing ("WDM") in Haas in order to transmit more data over the same optical fiber.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claims 6, 21, and 25.

13. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Haas article as applied to claim 2 above, and further in view of Patent No. 4,289,373 to Sugimoto et al. (hereinafter "Sugimoto").

Regarding claim 7, the Haas article differs from the claim in that it does not expressly teach a second optical source having an output that is coupled to the output of the second spatial mode converter, the second optical source generating a second optical signal having a second wavelength at the output.

Sugimoto, on the other hand, teaches a second optical source 25 having an output that is coupled to the output of an optical connector 35, the second optical source generating a second optical

signal having a second wavelength at the output (column 3, lines 3-20). Figure 1 of Sugimoto is reproduced below.

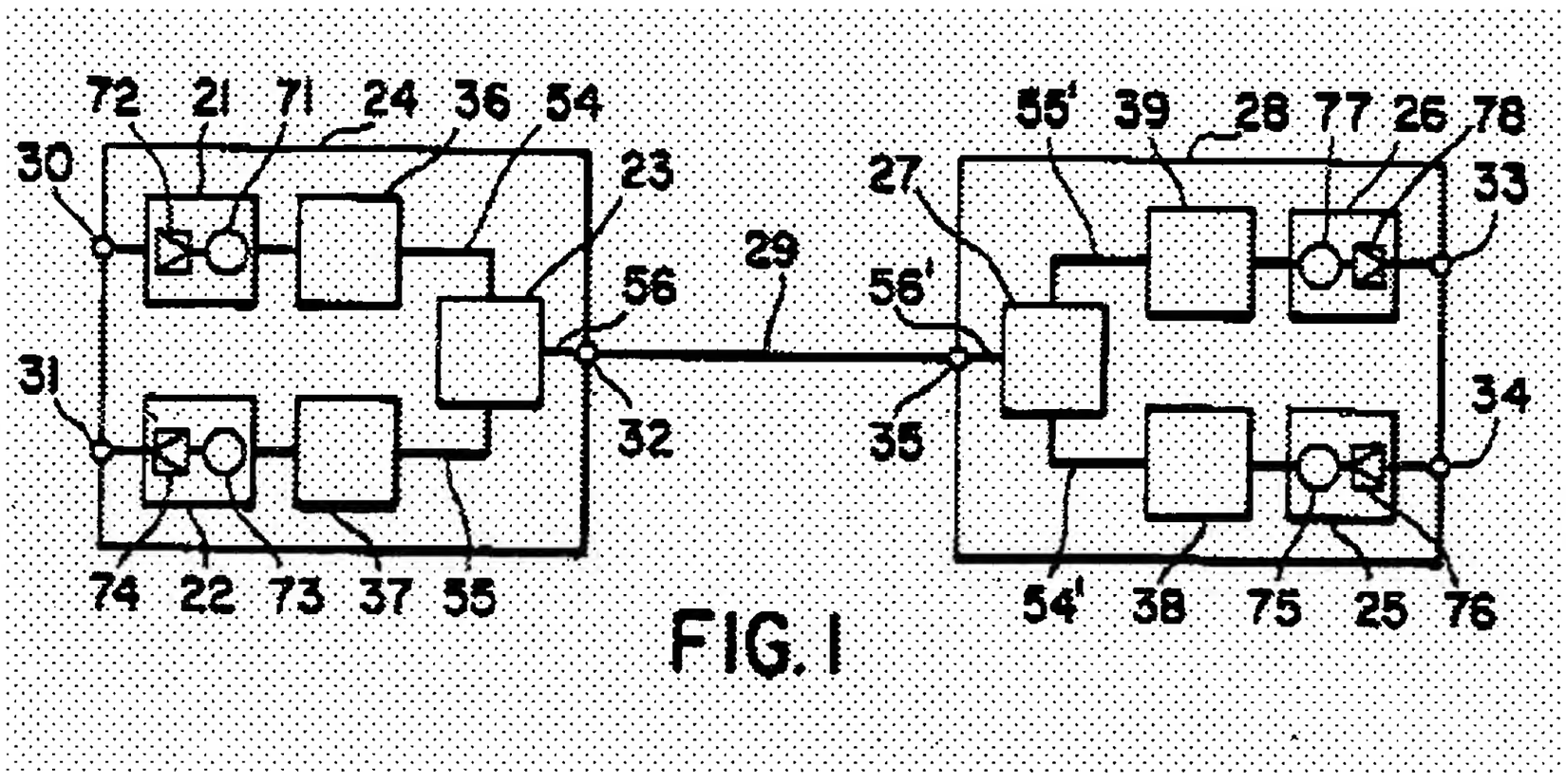

FIG. 1

The ordinary skilled artisan would have been motivated to use a second optical source similar to the one taught by Sugimoto in Haas in order to provide bi-directional transmission. See Sugimoto at column 1, lines 7-20.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claim 7.

14. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haas as applied to claim 1.

Regarding claims 8-9, Haas discloses all the elements of claim 1 but does not teach mode converters that comprise fusion splices as recited by claim 8 or mode converters comprising a lens imaging system having refractive and diffractive elements as recited by claim 9.

It would have been an obvious matter of design choice to modify Haas to use fusion splices or a lens imaging system having refractive and diffractive elements since applicant(s) have not disclosed that fusion splices or a lens imaging system solves any stated problem or is used for any particular purpose and it appears that the invention would perform equally well with the rotary splices taught by Haas.

The ordinary skilled artisan would have wanted to use a fusion splice in Haas in order to provide a more secure, permanent connection. The ordinary skilled artisan would have wanted to use a lens imaging system in Haas to more easily adjust the amount of light between the two fibers by focusing the lens elements.

Thus, the invention specified by claims 8 and 9 are considered obvious variants of Haas without a perceived criticality.

15. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Haas as applied to claim 1 above, and further in view of Patent No. 6,064,786 to Cunningham et al. (hereinafter "Cunningham").

Regarding claim 13, Haas does not teach a predetermined offset between a core of the single mode optical fiber and a core of the multi-mode optical fiber.

Cunningham teaches this missing limitation as shown in his Figure 10 reproduced below (see also column 7, lines 17-21 of Cunningham).

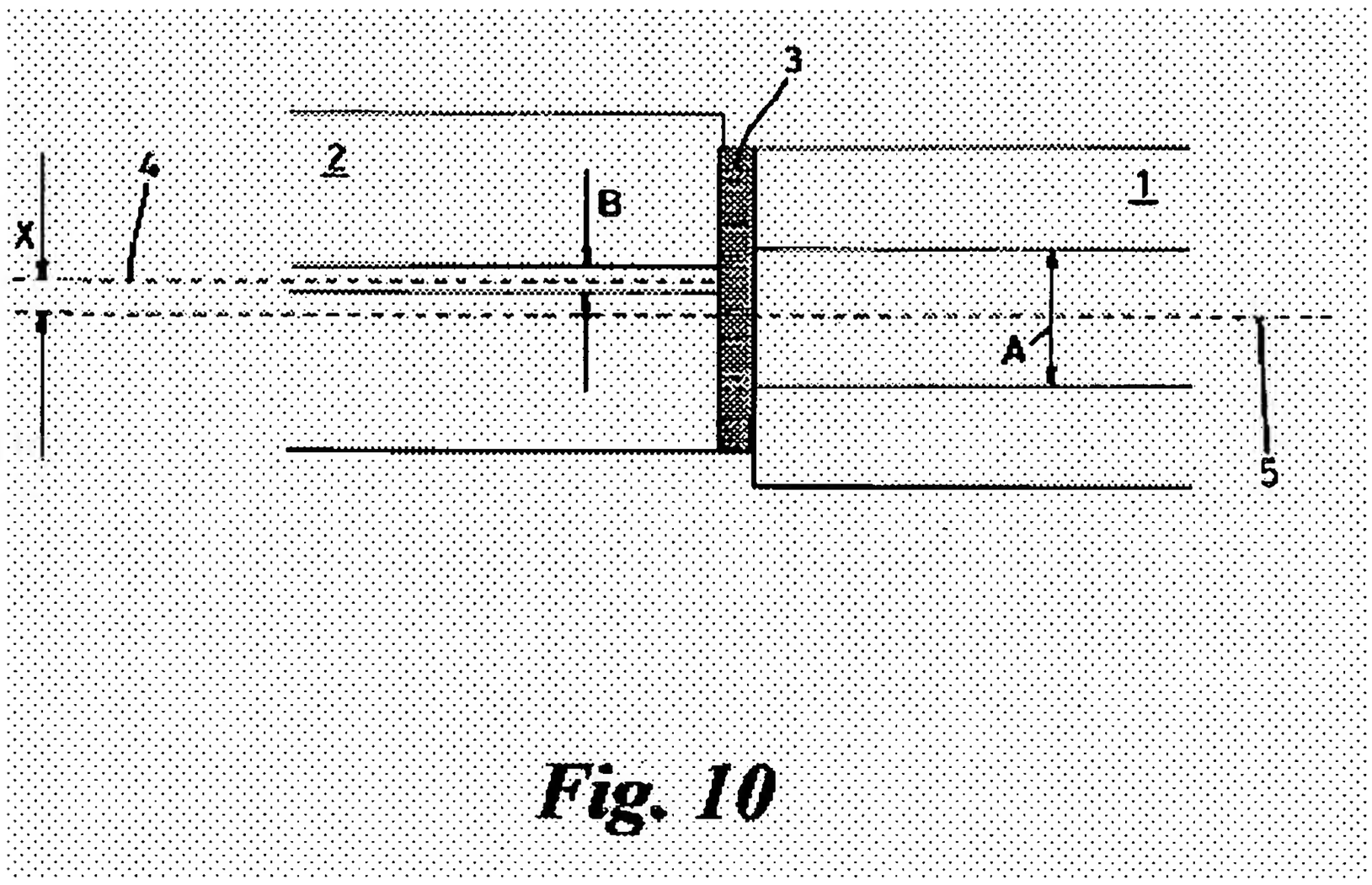

Fig. 10

Motivation to combine Haas with Cunningham is given by Cunningham in col. 3, lines 2-17 ("reduction in modal dispersion," "increase in bandwidth," etc.).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to obtain the invention specified by claim 13.

Conclusion

16. Since the Haas reference used in the above rejection was submitted by applicant(s) in the prior art statement, no copies thereof are being provided with this Office action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Omar Rojas whose telephone number is (571) 272-2357. The examiner can normally be reached on Monday-Friday (7:00AM-3:00PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick, can be reached on (571) 272-2344. The official facsimile number for regular and

After Final communications is (703) 872-9306. The examiner's RightFAX number is (571) 273-2357.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Omar Rojas
Patent Examiner
Art Unit 2874

or
June 1, 2005

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.

EXAMINER	
ART UNIT	**PAPER**
0605	

DATE MAILED:

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner for Patents

Enclosed is a supplemental Office action correcting an error found in the previous Office action, Paper No. 0505. The time for applicant's response is reset accordingly.

Omar Rojas
Patent Examiner
Art Unit 2874